

**Arizona Department of Environmental Quality**  
**Technical Review and the Evaluation of the**  
**Application for Air Quality Permit**  
**Proposed Permit Number 44516**

**I. INTRODUCTION**

This Class II synthetic minor permit is for the operation of water heaters and generators, at the Arizona State Prison in Kingman, Arizona. This is a renewal of Air Quality Control Permit Number 33916.

**A. Company Information**

Mailing Address: Management & Training Corporation  
Arizona State Prison  
P.O. Box 3939  
Kingman, AZ 86482

Facility Address: ASP-K  
4626 W English Drive  
Golden Valley, AZ 86414

**B. Background**

This permit will supersede the General Permit for Generators #33916 previously issued to the facility.

**C. Attainment Classification**

(Source: 40 CFR 81.303)

The proposed source is located in an area that is designated attainment/unclassified for all criteria pollutants: total suspended particulate (TSP), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), carbon monoxide (CO), lead (Pb), and ozone (O<sub>3</sub>).

**II. FACILITY DESCRIPTION**

The site operates 33 water heaters, 1 boiler and six emergency generators (ICs). The equipment covered by this permit can be found in Attachment "C" of the permit.

When operating the 34 water heaters and six generators for 8,760 hours per year, facility has a potential to emit (PTE) more than 100 tons per year of criteria pollutants. To obtain synthetic minor status the source's, the facility is permitted to operate each of the generators for a maximum of 2,500 hours per year on a twelve month rolling basis. The water heaters are permitted to operate for 8,760 hours per year.

Management and Training Corporation is limited to burning only natural gas in the heaters and diesel fuel in the internal combustion engines.

A. Process Description

1. The natural gas fired recirculating hot water heaters serve the facility without restriction 24 hours per day/365 days per year, for building demand.

Since the water heaters are fired with natural gas, it is expected that there will not be any visible emissions. Therefore no visible emissions monitoring requirements have been included in this permit.

2. The diesel powered generators used at this facility serve as emergency back-up in the event the public utility fails. The generators typically operate only during routine weekly start-ups, maintenance, and loss of utility power.

B. Air Pollution Control Equipment

Emissions from the generators are kept below major source threshold values by limiting their operation to 2,500 hours per year.

### III. LEARNING SITES POLICY

In accordance with ADEQ's Environmental Permits and Approvals Near Learning Sites Policy, the Department conducted an evaluation to determine if any nearby learning sites would be adversely impacted by the Arizona State Prison facility. Learning sites consist of all existing public schools, charter schools and private schools at the K-12 level, and all planned sites for schools approved by the Arizona School Facilities Board at the time of permit issuance (or approval). The learning sites policy was established to ensure that the protection of children at learning sites is considered before a permit approval is issued by ADEQ

As of June 26, 2008, the Department has found no learning sites within a two mile radius of the facility. As a result, ADEQ has determined that the operation of the facility will not adversely affect learning sites.

### IV. COMPLIANCE HISTORY

There have been no inspections associated with this facility. No Air Quality cases and/or violations have been developed for this facility. At this time, there are no cases or alleged violations.

### V. APPLICABLE REGULATIONS

The applicable regulations listed in Table 3 below were identified by the Department. The source is required to list any additional regulations that may be applicable.

**Table 1: Verification of Applicable Regulations**

Unit	Control Device	Rule	Verification
Boiler and Water Heaters	None	A.A.C. R18-2-724	This standard is applicable to fossil fuel-fired industrial and commercial equipment
Stationary Rotating Machinery	Fuel sulfur content	A.A.C. R18-2-719	This standard is applicable to all internal combustion engines
Fugitive Dust Sources	Water and other equivalent controls	A.A.C. R18-2-602 A.A.C. R18-2-604 A.A.C. R18-2-605 A.A.C. R18-2-606 A.A.C. R18-2-607 A.A.C. R18-2-614 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources.
Mobile Sources	Water and other equivalent controls	A.A.C. R18-2-801 A.A.C. R18-2-802 A.A.C. R18-2-804	These standards are applicable to all mobile sources
Other Periodic Activities	Particulate matter control, proper selection of approved paint materials, hazardous air pollutant control	A.A.C. R18-2-702.B1 A.A.C. R18-2-726 A.A.C. R18-2-1101.A.8	These standards are applicable to all periodic activities including abrasive blasting, use of paints and demolition/renovation of asbestos-containing buildings.

## VI. EMISSIONS

### Emergency Generators

The factors used to calculate emissions from the emergency generators were taken from Tables 3.4-1 and 3.4-2 of AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.

The calculated potential to emit (PTE) nitrogen oxides (NO<sub>x</sub>) for this facility when operating 8,760 hours per year is in excess of the 100 tons per year major source threshold. The facility will avoid classification as a major source by accepting a voluntary limitation of 2,500 hours per engine per year for the emergency generators on a 12-month rolling basis to qualify for synthetic minor status. The heaters may operate for up to 8,760 hours per year.

**Table 2 -Facility Potential to Emit with/without Voluntary  
Limitation of 2,500 hrs/yr for Generators**

Pollutant	Emissions	
	8760 hrs/year	2,500 hrs/year
	tons/year	
CO	72.86	22.28
VOC	38.51	29.87
NOx	314.84	91.61
PM <sub>10</sub>	11.72	3.48
PM	11.72	3.48
SO <sub>2</sub>	72.45	20.69

## VII. PREVIOUS PERMITS AND CONDITIONS

### A. Previous Permits

**Table 3: Previous Permit**

Date of Permit Issuance	Permit Number	Application Basis
January 20, 2005	33916	General Permit for Generators

### B. Previous Permit Conditions

The previous permit issued to the facility was a General Permit for Generators. The source no longer qualifies for a general permit. Because the permitting process for a Standard Class II Permit is significantly different than that for a General Permit for Generators, the Department did not rely on the previous permit in establishing the current permit conditions.

## VIII. MONITORING REQUIREMENTS

### Internal Combustion Engines

The Permittee is required to perform a monthly visual survey of the emissions when the engines are in operation. If the survey indicates that emissions may be exceeding the opacity limit, the permit requires the Permittee to perform a 6-minute EPA Reference Method 9 observation. The Permittee must report all 6-minute periods during which the visible emissions exceed the opacity standard.

## IX. AMBIENT AIR IMPACT ANALYSIS

### A. Introduction

ADEQ completed a modeling analysis to determine whether the air quality impacts from the internal combustion engines and the water heaters will cause or contribute to a violation of any air quality standard, or worsen an existing air quality problem. The applicable standard applied is the National Ambient Air Quality Standard (NAAQS).

## B. Modeling Analysis Overview

### 1. Air Quality Model

The dispersion modeling analysis was run using the EPA approved SCREEN3 modeling program. The SCREEN3 model was run using screening meteorology, rural dispersion coefficients, and flat terrain. The modeling for this source is based on an operating schedule of 8,760 hours per year.

SCREEN3 is a steady state, single source, Gaussian dispersion model developed to provide an easy to use method of obtaining pollutant concentration estimates. SCREEN3 is a USEPA approved screening model for estimating impacts at receptors located in simple terrain and complex terrain due to emissions from simple sources. The model is capable of calculating downwind ground level concentrations due to point, area, and volume sources. In addition, SCREEN3 incorporates algorithms for the simulation of aerodynamic downwash induced by buildings.

### 2. Modeled Emissions

The modeling results showed that no NAAQS will exceed the referenced standards.

The NAAQS is made up of background numbers which are available from a nearby station, in this case Kingman, plus the levels obtained from PTE for the water heaters and generators.

**Table 4: Modeling Analysis NAAQS Summary  
All Water Heaters and Generators**

Pollutant	Background <sup>1</sup>	Total	NAAQS (µg/m <sup>3</sup> )	NAAQS %
NO <sub>2</sub> - Annual	4	4.41E+01	100	44.05%
CO - 1-hour	582	2.54E+03	40000	6.36%
8-hour	582	7.54E+02	10000	7.54%
PM <sub>10</sub> - 24-hour	50.7	5.75E+01	150	38.31%
Annual	21.6	2.35E+01	50	46.91%
SO <sub>2</sub> - 3-hour	170	6.61E+02	1,300	50.82%
24-hour	54	8.26E+01	365	22.62%
Annual	7	1.45E+01	80	18.08%

1. Kingman background values as provided by JYang to WBixler on 10/29/07 for work on Permit #44232

## X. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
CO	carbon monoxide
EPA	Environmental Protection Agency
FCI	Federal Correctional Institution
HAP	Hazardous Air Pollutant(s)
hr	hour(s)
lb	pound(s)
lb/hr	pound(s) per hour
MSDS	Material Safety Data Sheet(s)
NAAQS	National Ambient Air Quality Standards
NO <sub>x</sub>	nitrogen oxides
PM	particulate matter
PM <sub>10</sub>	particulate matter less than or equal to 10 microns
PTE	potential-to-emit
SO <sub>x</sub>	sulfur dioxide
tpy	ton(s) per year
µg/m <sup>3</sup>	microgram(s) per cubic meter
VOC	volatile organic compounds